September 9, 1998

This document was submitted to EPA by a registrant in connection with EPA's evaluation of this chemical and it is presented here exactly as submitted.

Asm 12/OPP #34136

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March 29, 1996

VALENT®

10PP

NALED REREGISTRATION:
NALED ECOLOGICAL RISK
MITIGATION PROPOSAL

Case No.:	0092 Naled
EPA Chemical No.:	034401
EPA Company No.:	59639

Ms. Susan Jennings
Office of Pesticide Programs, H7504C
Document Processing Desk: DCI-SRRD-0092
U.S. Environmental Protection Agency
Room 266A, Crystal Mall 2
1921 Jefferson Davis Highway
Arlington, VA 22202

Dear Ms. Jennings:

As promised during our meeting of March 12, 1996, we are submitting a proposal to amend label language associated with naled agricultural uses, in order to reduce naled exposure to aquatic organisms resulting from application drift and runoff.

Drift Mitigation

As discussed at our meeting, both EFED and Valent agree that the majority of naled loading to aquatic systems as predicted by aquatic exposure models results from application drift. Loading contributed in surface water runoff is a relatively minor contributor. Therefore, it makes sense to focus on drift reduction in our efforts to reduce exposure to aquatic systems.

EFED requested that we draft our mitigation proposal based on data generated by the Spray Drift Task Force (SDTF). Valent is an active member of the SDTF, and we are providing in the attachment two tables summarizing data from field trials conducted by the SDTF. First, it should be noted that EPA has not completed its review of the SDTF drift data. Second, the SDTF is currently drafting a regulatory paradigm based on the submitted data, which would include a three-tiered process for assessment of off-site movement of pesticides from agricultural areas due to drift, and generic label mitigation language appropriate to each tier. The focus of this effort is currently aerial application, although eventually the paradigm will address airblast applications as well. The draft paradigm has not yet been circulated within industry or EPA, although we expect this to happen within the next several months. Therefore, rather than attempting to formulate a proposal based directly on SDTF data without the benefit of an approved regulatory assessment approach, we are instead proposing interim mitigation label language based on established precedent.

To date, the precedent for EPA approval of labeling designed for drift mitigation is contained in pyrethroid insecticide use directions for cotton. This labeling was agreed to by EPA and the

Pyrethroid Working Group, an association of pyrethroid registrants including Valent. Based on this precedent, we are proposing mitigation language for naled agricultural uses in the form of general precautions and use-specific application buffer zones and recommendations. The general precautions are a synthesis of language approved by EPA for the application of pyrethroid insecticides on cotton, and language recommended for aerial application by the Spray Drift Task Force (SDTF). The crop-specific precautions for tree and vine crops include application techniques that will substantially reduce spray drift from air-assisted or airblast applications, based on Spray Drift Task Force findings. Valent believes that the proposed buffer zones will be protective of aquatic ecosystems, given the fact that, whereas naled has similar acute toxicity to aquatic invertebrates as the pyrethroids, its acute toxicity to fish is 2-3 orders of magnitude lower than pyrethroids, and it is much less persistent in the environment

Runoff Mitigation

Valent has already proposed the following language to be placed under the ENVIRONMENTAL HAZARDS section of the DIBROM 8 Emulsive label: *Do not apply within 24 hours following rainfall or irrigation, or in areas where intense or sustained rainfall is forecasted to occur within 24 hours following application.* Valent stands behind this proposal, and we consider it to be reflective of prudent agricultural practice. We stated in our March 12, 1996 meeting that the proposed language would result in significant reduction of loading to aquatic systems resulting from runoff. We have confirmed this premise by a re-analysis of aquatic exposure using computer models (PRZM 2.3 and EXAMS II). EEC's were recalculated using one of the worst-case runoff scenarios included in our June 1995 submission[1], *without* correction to prohibit same day application/rainfall events. The results are summarized below, and will be submitted to you in more detail along with electronic input files shortly. These results are predictable given the extremely short half-life of naled.

	Aquatic Exposure Concentrations (ppb)		
	Instantaneous	Acute (96-hour)	Chronic (21-day)
Correction made to PRZM 2.3 input file to prohibit same day application and rainfall	3.67	1.30	0.45
No correction made to PRZM 2.3 input file to prohibit same day application and rainfall	19.58	5.90	1.28

Although Valent originally proposed the possibility of extending the interval between application

[1]W.M. Williams, J.M. Cheplick, A.M. Ritter, *Probabilistic Modeling of Naled Exposure to Aquatic Nontarget Organisms (DIBROM®)*, prepared by Waterborne Environmental, Inc., June 9, 1995. The use scenario selected for comparison of results with and without prohibition of same day application/rainfall, was identified B83DV23 (broccoli, five applications at 1.92 kg a.i./ha. at 7 day intervals, southern Texas MLRA 83D).

and rainfall or irrigation as a mitigation option, we do not currently believe that this would be practical, since weather is extremely variable and unpredictable in some parts of the U.S. during crop production months.

Application buffer zones proposed for drift mitigation will also automatically mitigate runoff loading to aquatic systems through the influences of volatilization, degradation, dilution, adsorption to untreated soil, and absorption by intervening vegetation. In the attached proposal, Valent is including label language requiring the establishment of a ten foot vegetative filter strip adjacent to aquatic areas, to further mitigate off-site movement of naled resulting from drift and runoff.

EFED requested that Valent consider the use of retention ponds to mitigate runoff for certain "high risk" uses/sites. Valent is not proposing such mitigation language at this time because the risk characterization and proposed mitigation measures are already based on worst-case "high risk" use scenarios. "High risk" may be defined in this case as a function of (1) proximity to aquatic areas, and (2) rainfall frequency or volume. The first factor is being addressed in this proposal through the establishment of application buffer zones, and the second is being addressed through the restriction against applying within 24 hours of rainfall or irrigation. In light of these measures, Valent does not believe that any additional mitigation measures are needed specific to runoff.

In the attached proposal, Valent is making significant steps towards addressing perceived risks of naled use to aquatic invertebrates. We wish to point out, however, that there is still no direct evidence that naled constitutes a significant or long-term hazard to aquatic ecosystems. EPA has already stated that the ecological risk assessment for naled was based on multiple conservative assumptions and defaults. The subject proposal will thus simply result in providing an additional safety factor for already low potential exposure to aquatic organisms. Please consider the attached proposal in the final drafting of the Environmental Fate and Effects chapter of the RED document. If you have any questions, please call me at (510) 256-2770, or Brent Solomon at our Washington, D.C. office (202) 872-4682.

Sincerely,

Daniel P. Fay

Daniel P. Fay
Project Manager
Registration & Regulatory Affairs

Attachment

cc:

Mr. Robert Forrest
Product Manager, PM Team 14
Registration Division, EPA/OPP

(3)

Valent Proposal for Mitigation of Off-Site Deposition from Naled Agricultural Applications

To address EPA's concern regarding potential hazard to aquatic invertebrates, Valent is proposing to amend DIBROM® 8 Emulsive use instructions for agricultural crops with language designed to reduce off-site movement resulting primarily from spray drift. The proposed language is organized as a series of general instructions and precautions, followed by instructions and precautions specific to vegetable and field crops, and tree and vine crops. The spray drift language outlined in the general precaution section is a synthesis of language approved by EPA for the application of pyrethroid insecticides on cotton, and language recommended for aerial application by the Spray Drift Task Force (SDTF)[2]. The crop-specific precautions for tree and vine crops include application techniques that will reduce the spray drift from air-assisted or airblast applications.

EFED has requested that Valent draft its mitigation proposal based on data generated by the SDTF. Valent is an active member of the SDTF, and we are providing in this document two tables summarizing data from field trials conducted by the SDTF. It should be noted however that EPA has not completed its review of the SDTF drift data. In addition, the SDTF is currently drafting a regulatory paradigm based on the submitted data, which would include a three-tiered process for assessment of off-site movement of pesticides from agricultural areas due to drift, and generic label mitigation language appropriate to each tier. The focus of this effort is currently aerial application, although the paradigm will eventually address airblast application as well. The draft paradigm has not yet been circulated within industry or EPA, although we expect this to happen within the next several months. Therefore, rather than attempting to formulate a proposal based directly on SDTF data without the benefit of an approved regulatory assessment approach, we are instead proposing interim mitigation label language based on established precedent.

To date, the precedent for approval of labeling containing buffer zones for mitigation of off-site deposition is contained in pyrethroid insecticide use directions on cotton. These buffer zones (25 feet for ground application, 150 feet for aerial application) were agreed to between EPA and the crop protection industry's Pyrethroid Working Group (PWG), of which Valent is a member.

Valent hereby proposes to institute the same ground and aerial application buffer zones approved for the pyrethroid use on cotton, along with generic drift advisory statements recommended by the Spray Drift Task Force, on its labeling for use of naled on field and vegetable crops. Valent believes that these buffer zones will be sufficiently protective of aquatic organisms, given the fact that, while naled has acute toxicity to aquatic invertebrates similar to that of the pyrethroids, its acute toxicity to fish is 2-3 orders of magnitude *lower* than pyrethroids, and it is much less persistent in the

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[2]Sandra L. Bird et.al. 1996. *A Proposed Screening Level Assessment Method for Aerial Spray Drift of Pesticides.* Unpublished report jointly prepared by EPA's Office or Research and Development and SDTF scientists under a Cooperative Research and Development Agreement.

environment.[3] Adopting the buffer zones approved for pyrethroids confers the additional advantage of maintaining a consistent use direction between different products used on the same or similar crops, thus limiting the potential for accidental misuse in the field.

Buffer zones designed to mitigate drift from airblast applications have not been agreed to between EPA and the PWG. However, Valent has recently submitted rationale supporting establishment of buffer zones corresponding to new orchard and vineyard uses for its pyrethroid insecticide, DANITOL® 2.4EC Spray (fenpropathrin)[4]. We propose to adopt the same proposed buffer zones (50 feet for vine and orchard crops with full foliage, 100 feet for dormant or delayed dormant stage crops) for naled agricultural airblast uses, and propose to incorporate crop-specific label language to this effect. Once again, given the relative toxicity of naled to aquatic organisms and its rapid environmental degradation compared to pyrethroids, we believe that the proposed buffer zones, in combination with the proposed drift advisory language, will provide adequate protection to aquatic systems. Based on SDTF data Valent is also providing other recommendations designed to reduce drift from airblast applications, including a requirement that users spray the outside two rows of orchards and vineyards using nozzles directed toward the inside of the orchard/vineyard only.

Finally, it is clear that the measures used to mitigate off-site deposition from drift, will also reduce off-site deposition resulting from runoff. The greater the distance from the zone of application to the aquatic system, the greater the opportunity for the following influences to reduce residues in runoff water: volatilization, degradation, dilution, soil adsorption, and absorption by intervening vegetation. Included in the mitigation language proposed by Valent is a requirement that the ten feet next to the aquatic area are not be cultivated, so as to allow growth of a vegetative filter strip. Once again, this is language already approved by EPA for drift and runoff reduction on pyrethroid labels.

For EPA's reference, Valent is providing Spray Drift Task Force (SDTF) data in Tables 1 and 2 below, as reported from ground and aerial application trials conducted in 1992-93, and orchard airblast trials conducted in 1993-94. Deposition results are reported as a percentage of application rate. Drift deposition data from the following two Spray Drift Task Force reports have been summarized in Table 1:

1. *Drift from Applications with Ground Hydraulic Sprayers: Integration and Summary of 1992 and 1993 Studies*: SDTF Study I94-001. Unpublished study prepared by Stewart Agriculture Research Services, Inc. (MRIDs 43493801, 43493802).

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[3]Based on information contained in *The Pesticide Manual Incorporating The Agrochemicals Handbook*, 10th ed., editor Clive Tomlin, 1994.

[4]Letter dated 2/28/96 from David A. Wustner, Valent to George T. LaRocca OPP/RD/PM13; registration amendment OPP ID No. 154342.

2. *Drift from Applications with Aerial Sprayers: Integration and Summary of 1992 and 1993 Studies*: SDTF Study I94-002. Unpublished study prepared by Stewart Agriculture Research Services, Inc. (MRIDs 43254001, 43535801, 43535802).

Table 2 summarizes drift deposition data on airblast applications from the following report:

3. *Drift from Orchard Airblast Applications: Integration and Summary of 1993 and 1994 Studies*: Lab Project Number F95-004. Unpublished study prepared by Stewart Agriculture Research Services, Inc. (MRID 43925701)

Table 1: 1992/93 Ground Hydraulic and Aerial SDTF Study Data
Downwind Ground Deposition (Horizontal Feet from field edge)
Percent of Field Application Rate

Downwind Distance (ft)	Ground Hydraulic Sprayers[1]		Aerial Sprayers[2]	
	Mean Deposition	95% Upper Limit	Mean Deposition	95% Upper Limit
25	0.58	0.67	18.5	21.1
50	0.37	0.42	9.27	10.36
75	0.25	0.30	5.27	5.89
100	0.18	0.22		
125			3.19	3.62
150	0.12	0.15		
175			1.95	2.24
200	0.091	0.11		
275			0.718	0.828
300	0.054	0.064		
425			0.296	0.342
450	0.033	0.04		

[1]From Section 8.6 and Table 12 of SDTF Report I94-001.
[2]From Section 9.14 of SDTF Report I94-002.

Table 2: 1993/94 Orchard Airblast SDTF Study Data
Downwind Ground Deposition (Horizontal Feet from field edge)
Percent of Field Application Rate

Crop	Average Height (ft)	Average Width (ft)	Row Spacing (ft)	Downwind Distance (ft)			
				25	50	100	300
Grapes	6	6	12	0.77	0.237	0.096	0.013
Grapes[1]	6	6	12	0.104	0.06	0.03	0.008
Apples	14	9	16	0.544	0.087	0.123	0.028
Almonds	26	19.5	22	2.84	0.71	0.152	0.03
Dormant Apples	14	9	16	12.2	8.19	2.05	0.083
Oranges	17	17	22	3.47	1.6	0.468	0.062
Grapefruit Large	14	---	---	4.925	3.88	0.746	0.07
Grapefruit Small	8	---	---	11.92	5.59	2.19	0.11

From SDTF Study 195-004 Tables 7 and 9. Deposition values are given as the sum of inside and outside orchard deposition (expressed as percent of application rate) for tree/vine crops, except for grapefruit, for which only outside treatment data were generated. Outside and inside treatments were applied independently and at different times. Except for grapefruit, values in this table were calculated as the mean across reps for the outside treatment, plus the mean across reps for the inside treatment. **Outside treatment** = first pass of airblast sprayer (one side only) made to downwind side of furthest downwind row, followed by passes made with both sides of sprayer treating rows 1 & 2 and 2 & 3 , counting from downwind edge of field. **Inside treatment** = both sides of sprayer used to treat rows 3 & 4, 4 & 5, and 5 & 6 , counting from downwind edge of field.

[1]Applied using a wrap-around sprayer

DIBROM® 8 Emulsive

PROPOSED LABEL LANGUAGE FOR MITIGATION OF OFF-SITE DEPOSITION FROM AGRICULTURAL APPLICATIONS

SPRAY DRIFT MANAGEMENT

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.

The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making decisions.

OBSERVE THE FOLLOWING PRECAUTIONS WHEN MAKING ANY APPLICATION TO AGRICULTURAL CROPS IN THE VICINITY OF AQUATIC AREAS SUCH AS LAKES; RESERVOIRS; RIVERS; PERMANENT STREAMS, MARSHES, OR NATURAL PONDS; ESTUARIES AND COMMERCIAL FISH FARM PONDS.

General precautions (aerial, ground and air-assisted/airblast applications):

- All aerial, ground and air-assisted/airblast application equipment must be properly maintained and calibrated using water as carrier.
- Do not cultivate within 10 feet of the aquatic area so as to allow growth of a vegetative filter strip to alleviate drift, and mitigate runoff.
- Use the largest droplet size consistent with pest control. Formation of very small drops may be minimized by (1) using a nozzle type designed for the intended application, (2) selecting high flow rate nozzles, (3) avoiding spray pressure which exceeds the nozzle manufacturer's recommendation, (4) using the minimum number of nozzles that provide uniform coverage, and (5) orienting nozzles away from the air stream as much as possible (for aerial and air assisted/airblast application). Do not increase spray volume by increasing spray pressure.
- Risk of exposure to aquatic areas can be reduced by avoiding applications when wind direction is toward the sensitive areas.
- When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

General precautions (aerial applications only):

The first two drift management requirements listed below *must* be followed to avoid off-target movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications or public health uses. Where states have more stringent requirements, they should be observed.

- NOZZLES MUST ALWAYS POINT BACKWARD PARALLEL WITH THE AIR STREAM, AND NEVER BE POINTED DOWNWARDS MORE THAN 45 DEGREES.

- THE DISTANCE OF THE OUTERMOST NOZZLES ON THE BOOM MUST NOT EXCEED 3/4 THE LENGTH OF THE WINGSPAN.

- Do not apply this product as an ultralow volume (ULV) spray (<½ gallon per acre), or in any carrier other than water.

- For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan length may further reduce drift without reducing swath width.

- Aerial applications should not be made at a height greater than 10 feet above the top of the target plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

- Drift potential is lowest between wind speeds of 2 - 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph if variable wind direction and high inversion potential exist. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

- Applications should not occur during local, low level temperature inversions. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Inversions are characterized by stable air and increasing temperatures with altitude. Their presence can be indicated by ground fog, or, by the movement of smoke that layers and moves laterally in a concentrated cloud (under low wind conditions). The applicator may use a smoke generator or other smoke source to determine whether an inversion is present.

Precautions specific to field and vegetable crops (beans, broccoli, Brussels sprouts, cabbage, cauliflower, celery, collards, cotton, eggplant, kale, melons, peas, peppers, safflower, spinach, strawberry, summer squash, Swiss chard, and sugar beets):

Ground Application

- Do not apply by ground within **25 feet** of lakes; reservoirs; rivers; permanent streams, marshes, or natural ponds; estuaries and commercial fish farm ponds, where wind is blowing or gusting toward these areas.

Aerial Application

- Do not apply by air within **150 feet** of lakes; reservoirs; rivers; permanent streams, marshes, or natural ponds; estuaries and commercial fish farm ponds, where wind is blowing or gusting toward these areas.

Precautions specific to air assisted (airblast, mist blower, etc.) applications to tree and vine crops (almond, citrus, grape, peach, and walnut):

- Do not apply by air-assisted/airblast application to almonds or peaches (dormant / delayed dormant use) within **100 feet** of lakes; reservoirs; rivers; permanent streams, marshes, or natural ponds; estuaries and commercial fish farm ponds, where wind is blowing or gusting toward these areas.

- Do not apply by air-assisted/airblast application to grapes, citrus or walnuts within **50 feet** of lakes; reservoirs; rivers; permanent streams, marshes, or natural ponds; estuaries and commercial fish farm ponds, where wind is blowing or gusting toward these areas.

- Spray the outside two rows using nozzles directed toward the inside of the orchard/vineyard only. Shut off nozzles when turning at the ends of rows. Further reduction of spray drift may be obtained by shutting the nozzles off (manually or automatically) when passing gaps between adjacent or missing trees or vines.

- Sprayer air deflectors and nozzle orientation should be adjusted to ensure that the spray pattern is properly directed toward the desired canopy location. Avoid spraying over the tops of trees by adjusting or turning off the top nozzles. Turn off as many nozzles as necessary to direct spray to small trees.